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PATENT APPLICATION

METHOD AND APPARATUS FOR THREE DIMENSIONAL OBJECT COVERS

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Method and Apparatus for Three Dimensional Object Covers

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FIELD OF THE INVENTION

- 5 [0001] The present invention relates generally to covers for objects. More particularly, the invention relates to three-dimensional structures adapted to cover objects

BACKGROUND OF THE INVENTION

- [0002] Outdoor equipment, such as barbecues, and outdoor furniture are common in residential and commercial premises. When not in use, it is usually preferred that such items are covered with a weather resistant fabric to help protect them from the elements. Typically, these covers are simply shapeless, two-dimensional pieces of fabric designed based on mostly utilitarian considerations with respect to the weather protection they offer. Most people spend a significant amount of money and effort in making their outdoor area well decorated and entertaining; however, utilitarian outdoor covers are often esthetically displeasing and provide negligible value beyond a weather protection utility. When conventional outdoor equipment covers do attempt to be esthetically displeasing, they add colored surface patterns to the protective fabric, but otherwise passively droop over the article they are protecting.
- 10 [0003] While approaches to providing three-dimensional (3D) cover structures may exist, in practice they are not particularly suitable for practical application where lightweight, robustness, and esthetics all are often important considerations. Moreover, known approaches are not readily adaptable to achieve these considerations without undue experimentation and creative insight.
- 15 [0004] For example, some conventional approaches to creating 3D structure, such as cover with a 3D head, might stuff the 3D volume with materials similar to that used in children's stuffed animal toys. However, 3D covers made using this approach are known

to consume too much shelf space in retail outlets to be practical and likewise increase shipping and inventory cost to distributors. This is because they are heavy and rigid 3D structures that cannot collapse to consume less space. A full sized, stuffed cow head, for example, based on this approach would clearly need a very large container.

- 5 In an attempt to circumvent the weight and volume drawbacks to 3D structures that are stuffed to maintain rigidity, some known approaches have the consumer, instead, fill the 3D structures with commonly available stuffing matter such as newspapers or packing materials. However, it often takes a significant degree of expertise to get the 3D structure's shape correct, e.g., lumpiness, and the result is often esthetically displeasing.
- 10 The exact way the product looks and performs when used by a consumer is very important to building a valuable brand, and, thus, often renders these consumer-filling approaches undesirable.

- [0005] Other conventional techniques to overcome the drawbacks of rigid 3D structures use inflatable inserts, such as plastic bags or balls, to expand into the desired 15 3D structure upon inflation. However, this approach is known to suffer from eventual deflation, especially when exposed to daily outdoor heating and cooling cycles, which results in the 3D structure's drooping and losing their shape and rigidity. For long-term outdoor applications, this issue is usually unacceptable.

- Other conventional approaches to building 3D structures seek to employ wire
20 frame structures similar to a "Japanese" lantern. However, such approaches tend to work best only with mostly round objects, and are, among other reasons, not suitable in building relatively arbitrarily shaped 3D structures, and are moreover not readily adaptable into a 3D cover structure.

- [0006] In view of the foregoing, there is a need for improved techniques for
25 constructing 3D cover structures that are lightweight, robust, and collapsible and yet naturally restore their shape after being deformed. It would be desirable if they were also cost effective and easily manufactured. It would be further desirable if they are colorful, interesting, and humorous, while still offering all of the protection of conventional covers.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0007] The present invention is illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings and in which like reference numerals refer to similar elements and in which:
- 5 [0008] FIGURES 1a-e illustrate various views of a cow shaped 3D cover embodiment of the present invention;
- [0009] FIGURE 2 illustrates an underlying 3D head structure forming the cow head of FIGURE 1 according to an embodiment of the present invention;
- 10 [0010] FIGURE 3 illustrates how a desired exterior visual appearance may be provided according to an embodiment of the present invention;
- [0011] FIGURE 4 illustrates a perspective view of the stiffness creating method and structure according to an embodiment of the present invention;
- [0012] FIGURE 5 illustrates a front view of a UFO embodiment of the present invention;
- 15 [0013] FIGURE 6, illustrates a raised 3D structure formed in accordance with an alternative embodiment of the present invention;
- [0014] FIGS. 7 & 8 illustrate a top and bottom view, respectively, of UFO 500 shown in FIGURE 5;
- 20 [0015] FIGS. 9 a, b, c, and d illustrate the front, side, top, and bottom view, respectively, of an embodiment of the present invention having the appearance of a food container.
- [0016] FIGS. 10 a, b, c, d, and e illustrate the side, front, back, top, and bottom view, respectively, of an embodiment of the present invention having the appearance of a pig;
- 25 [0017] FIGS. 11 a, b, c, d, and e illustrate the front, side, back, top and bottom view, respectively, of an embodiment of the present invention having the appearance of a chicken.

- [0018] FIGS. 12 a, b, c, and d illustrate the front, side, top, and bottom of an embodiment of the present invention having the appearance of a “groucho” nose and glasses.
- 5 [0019] FIGS. 13 a, b, c, d, and e illustrate the front, back, side, top, and bottom of an embodiment of the present invention having the appearance of a gospel singer.
- [0020] FIGS. 14 a, b, c, d, and e illustrate the front, back, side, top, and bottom of an embodiment of the present invention having the appearance of a “good ol’ boy.”
- [0021] FIGS. 15 a, b, c, d, and e illustrate the front, back, side, top, and bottom of an embodiment of the present invention having the appearance of a race car.
- 10 [0022] FIGS. 16 a, b, c, and d illustrate the front, side, top, and bottom of an embodiment of the present invention having the appearance of a nun.
- [0023] FIGS. 17 a, b, c, and d illustrate the front, side, top, and bottom of an embodiment of the invention having the appearance of a caricature of Albert Einstein.
- [0024] FIGS. 18 a, b, c, and d illustrate the front, side, top, and bottom of an
- 15 embodiment of the invention having the appearance of a chili pepper.

Unless otherwise indicated illustrations in the figures are not necessarily drawn to scale.

SUMMARY OF THE INVENTION

- [0017] To achieve the forgoing and other objects and in accordance with the purpose of the invention, a variety of improved substrate structures and substrate fabrication techniques are described.

In an embodiment of the present invention, a three dimensional (3D) apparatus for use in protectively or esthetically covering objects is provided that includes an appropriately sized relatively thin structural material that when properly joined to itself or 25 a multiplicity of other appropriately sized relatively thin structural material forms a continuous structural surface having a desired 3D structural shape, whereby this formed 3D structural shape is joined to a substantially two-dimensional (2D), sufficiently flexible

cover material. In alternative embodiments, at least part of the 3D structural shape's exterior is covered with largely nonstructural, ornamental exterior materials and/or elements. In yet other alternative embodiments, at least part the 3D structural shape's interior is covered with a relatively more flexible material.

5 In some embodiments of the present invention, the volume formed by the 3D structural shape is filled with a filling material to give it added structural integrity and/or esthetic appeal. In other embodiments, embroidery stitched into the 3D structural shape to give it added structural integrity and/or esthetic appeal.

In an aspect of the present invention, a method is provided to create a three
10 dimensional (3D) apparatus for use in protectively or esthetically covering objects, which method includes appropriately sizing a relatively thin structural material and properly joining it to itself or a multiplicity of other appropriately sized relatively thin structural material to form a continuous structural surface having a desired 3D structural shape. The method further includes the step of joining the formed 3D structural shape to a
15 substantially two-dimensional (2D), sufficiently flexible cover material.

In some embodiments of the 3D cover method, the volume formed by the 3D structural shape is filled with a filling material to give it added structural integrity and/or esthetic appeal. In other embodiments of the 3D cover method, embroidery is stitched into the 3D structural shape to give it added structural integrity and/or esthetic appeal.

20 [0018] Other features, advantages, and object of the present invention will become more apparent and be more readily understood from the following detailed description, which should be read in conjunction with the accompanying drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

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[0019] The present invention is best understood by reference to the detailed figures and description set forth herein.

[0020] Embodiments of the invention are discussed below with reference to the Figures. However, those skilled in the art will readily appreciate that the detailed

description given herein with respect to these figures is for explanatory purposes as the invention extends beyond these limited embodiments. Thus, multiple three-dimensional (3D) cover embodiments shall be set forth to provide an appreciation of the attendant broad scope and nature of the present invention.

5 [0021] In a first embodiment of the present invention, a suitable two-dimensional (2D) cover is provided having 3D structures joined thereon, which resulting 3D cover is configured to protectively and/or ornamentally cover certain object, by way of example and not limitation, outdoor equipment such as barbeques and furniture such as chaise lounges. When constructed according to the teachings of the present invention, the
10 present 3D cover embodiment is relatively lightweight, flexible, and collapsible yet naturally restore to the desired 3D shape after being deformed. An aspect of the present embodiment, as will be described in some detail after this brief introduction, is to create 3D shapes by appropriately lining a covering material with a suitable backing material that, when properly joined, provides a desired structural 3D shape and support for the
15 covering material.

[0022] In accordance with the teachings of the present invention, an example of the present embodiment is illustrated in FIGURE 1. In the Figure, a cow shaped 3D cover 100 embodiment of the present invention is shown covering a conventional outdoor barbeque 110 (mostly hidden, but transparently outlined). It should be appreciated that
20 although a barbeque is shown in this example, any appropriate indoor or outdoor object is contemplated as a suitable application of the present invention.

[0023] FIGURE 1d illustrates a top view of the previous cow shaped 3D cover 100 in completed form according to an embodiment of the present invention. FIGURE 1e is a bottom view of the same cover showing among other features, the relationship of cow shaped 3D cover 100 covering conventional outdoor barbeque 110. It should be appreciated that alternative embodiments of the present invention may have alternative shapes and appearances than the cow example shown. Those in the art will further appreciate that yet other alternative embodiments are readily configured cover other suitable objects instead of barbeques.
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- [0024] As will be further described below, the 3D shapes such as a head 120, an appendage 130, a tail 140, and an ear 150 shown can be made to keep there shape by lining the covering material (i.e., the visible, surface material in the figure) with an underlying 3D structure made by joining a multiplicity of a thin, but relatively firm
- 5 backing material pieces (not shown), which when carefully choosing, according to the present invention, the direction of the seams between the joined backing material pieces, a multiplicity of desired 3D supporting structures can be arbitrarily constructed. That is, in the present embodiment, the 3D structure of the desired shape is achieved through the strategic implementation of the present seam joining method.
- 10 [0025] In one aspect of the present seam joining method, when two pieces of the backing material are joined together with a double seam they become relatively stiff, yet still relatively flexible. By way of example, FIGURE 2 illustrates an underlying 3D head structure 200 forming head 120 according to an embodiment of the present invention. To create a head structure according to this embodiment the backing material is
- 15 appropriately cut into a side face portions 210, an upper face portion 220, a lower face portion (not shown), and front face portion 230. To create a roundness shape to head structure 200, side face portion 210 and upper face portion 220 are joined at face joining seam 250, and likewise with the lower face portion (not shown). To further determine and maintain the curvature of the front portion of head structure 200, these joined face
- 20 portions are further held and set into proper curvature by being joined with front face portion 230 at front side seams 260 and front upper/lower seams 270. Likewise, the rear portion of head structure 200 is further held and set into proper curvature by appropriately joining head structure 200 to either the two-dimensional (2D) cover (e.g., as shown in FIGURE 1 where head 120 is joined with the 2D cover material of cow
- 25 shaped 3D cover 100) or other suitable 3D structures (not shown). In some embodiments, the area on the 2D cover material that is enclosed by rear seam 280 may include an appropriately sized hole to allow protruding portions of the object being covered to be properly received within the substantially hollow volume of the 3D structure, which 3D structure is created according to the teachings of present invention.
- 30 [0026] Those in the art will appreciate that a diverse multiplicity of desired curvatures and 3D structural features is achievable according to the present method by

way of relatively strait forward selection of appropriate design parameters that result in alternate configurations to suit the particular application. For example, the curvature of the head structure 200 is at least in part controlled by the number and circumferential length of side and upper/lower face portions 210 and 220, respectively, joined to form the 5 circumference of head structure 200; thus, effectively creating a piecewise linear approximation of a smooth curve. The curvature of the head structure 200 is additionally at least in part controlled by the size and curvature of front face portion 230 via joining seams 260 and 270, and similarly by the constraining curvature of rear seam 280. Those in the art will further readily appreciate that less curved and relatively squared angles are 10 achieved by appropriately configuring the side and upper/lower face portions 210 and 220, respectively, by way of example and not limitation, reducing their number and increasing their circumferential length, and by the appropriately shaping of front face portion 230 and joining them thereto.

[0027] In some embodiments of the present invention, a desired exterior visual 15 appearance is provided as illustrated by way of example, and not limitation, in embodiment of FIGURE 3. In the Figure, head structure 200 is appropriately covered with a covering material 310. Ornamental features such as ear 150 and eyes 160 may be added as shown. A multiplicity of techniques is contemplated for forming and joining such ornamental features to head structure 200 and/or covering material 310. In one 20 embodiment, for example, eyes 150 and nose 170 (not shown, see FIGURE 1) are embroidered to cause them to stand out from the softer surrounding fabric. This approach also adds structural support to the entire shape of head structure 200 by adding points where covering material 310 and/or the backing material are held relatively rigidly in place, thereby resisting folding or collapsing near that location.

[0028] FIGURE 4 illustrates a perspective view of the stiffness creating method and 25 structure according to an embodiment of the present invention. In this embodiment, a relatively stiff backing material 420 is sandwiched between covering material 310 and an interior material 430. In this example, they are joined at seam 450 by means of sewing them together; however, those in the art will recognize a multiplicity of alternate and 30 appropriate joining means, including gluing for example, to join the materials at seam 450 in accordance with the teachings of the present invention. Backing material 420

should preferably be selected stiff enough to hold/restore the underlying 3D structure according to the needs of the application, but still be flexible enough to easily deform if the particular application requires this capability. Those in the art will appreciate many other practical considerations in selecting the appropriate backing material 420, by way 5 of example and not limitation, it should be compliant with the method of joining seam 450, be weather resistant if meant for outdoor use, and etc. Suitable materials for certain applications include various known types of flexible foam and plastic sheeting.

[0029] Covering material 310 covers the underlying 3D structure formed by backing material 420, and may be selected to be a more flexible fabric than backing 10 material 420 and have the color, pattern, texture, and environmental protection desired for the particular application. Suitable choices include suitable, commonly available fabrics. Depending of the relative stiffness of interior material 430, it creates a stiffer medium when more support is required, for example but not by limitation, in supporting head 120 of FIGURE 1. The inclusion of interior material 430 also adds a resistance 15 sometimes needed to keep thread stitching from pulling though backing material 420 when backing material 420 is relatively soft. Those in the art will appreciate that some applications do not require the quilting of interior material 430 with backing material 420, and in alternate embodiments, interior material 430 is excluded while remaining in accordance with the teachings of the present invention. Thus, when used in conjunction 20 with the other teachings, the approach of the present embodiment provides for the creation of a hollow, skeletal 3D structures having the desired lightweight shape suitable for the particular application, and, which may be configured with a desired ornamental appearance to satisfy certain esthetic considerations. In some alternative embodiments, however, backing material 420 may also serve the purpose of covering material 310, 25 whereby covering material 310 is not used, and any ornamental features such as eyes, nose, ears, etc. may be directly joined to backing material 420.

[0030] In a second embodiment of the present invention, the inherent stiffness of the material, such as a fabric, is used to form and maintain the desired 3D shape. In some applications, if two pieces of material are sewn together the stiffness of the fabric 30 combines with the added structure of the seam and the joining means used, such as thread used to sew it, and thereby enables the fabric to hold its shape. The technique of the

present embodiment may be used to form, by way of example and not limitation, shapes such as ear 150 in FIGS. 1 and 3. The present embodiment is also suitable to form the shape of antennae 510 of a UFO embodiment of the present invention 500 as illustrated in FIGURE 5.

5 In a third embodiment of the present invention, a commonly available, lightweight stuffing material is used to form and maintain the desired 3D shape. In the present embodiment, as illustrated in FIGURE 6, the desired 3D structure is shaped by joining, by sewing or gluing for example, a covering material, such as fabric, to the underlying structure of the cover with a filling material sandwiched in between, thereby
10 forming a raised 3D structure 610, which those in the art will readily know how to configure appropriately according to the particular application. In the embodiment shown, raised 3D structure 610 as implemented for the UFO embodiment 500 is achieved by creating a stiff, tightly stuffed fabric ring. This ring is not only decorative, but it supports the structure of UFO embodiment 500 and hides some details of the object it is
15 covering, such as a barbecue in this example. In the present barbecue example, the barbecue kettle handle typically would interfere with the round appearance of the UFO, but due to the relative stiffness of raised 3D structure 610, the kettle handle is not visible. In other embodiments, 3D structure 610 serves mainly an ornamental, esthetic purpose, such as, for example, in the shape of tail 140 in FIGURE 1. In this application of the
20 third embodiment, to achieve a round, natural looking tail appearance, a material is formed in the shape of a tube, for example a sewn fabric tube, and is appropriately stuffed with the commonly available stuffing material.

 In a fourth embodiment of the present invention, embroidery is used to form and maintain the desired 3D shape for relatively small 3D structures. The tight stitching of
25 the embroidery substantially improves the stiffness of the underlying 3D structure, and allows featured parts to avoid wrinkling or folding, which is particularly useful certain features of the 3D cover more noticeably pronounced. For example, referring again to FIGURE 6, on UFO 500 barbecue cover, the embroidery used around a raised window 530 through which images may be placed such as the alien caricature shown. Raised
30 window 530 might otherwise fold or be less noticeable if it were not stiffened. A similar

approach may be used to form and stiffen the facial features, such as those shown for head 120 of FIGURE 1.

FIGS. 7 and 8 illustrate a top and bottom view, respectively, of UFO 500 shown in FIGURE 5. FIGS. 9 a, b, c, and d illustrate the front, side, top, and bottom view, respectively, of an embodiment of the present invention having the appearance of a food container, or bottle. FIGS. 10 a, b, c, d, and e illustrate the side, front, back, top, and bottom view, respectively, of an embodiment of the present invention having the appearance of a pig. FIGS. 11 a, b, c, d, and e illustrate the front, side, back, top and bottom view, respectively, of an embodiment of the present invention having the appearance of a chicken. FIGS. 12 a, b, c, and d illustrate the front, side, top, and bottom of an embodiment of the present invention having the appearance of a “groucho” nose and glasses. FIGS. 13 a, b, c, d, and e illustrate the front, back, side, top, and bottom of an embodiment of the present invention having the appearance of a gospel singer. FIGS. 14 a, b, c, d, and e illustrate the front, back, side, top, and bottom of an embodiment of the present invention having the appearance of a “good ol’ boy.” FIGS. 15 a, b, c, d, and e illustrate the front, back, side, top, and bottom of an embodiment of the present invention having the appearance of a race car. FIGS. 16 a, b, c, and d illustrate the front, side, top, and bottom of an embodiment of the present invention having the appearance of a nun. FIGS. 17 a, b, c, and d illustrate the front, side, top, and bottom of an embodiment of the invention having the appearance of a caricature of Albert Einstein. FIGS. 18 a, b, c, and d illustrate the front, side, top, and bottom of an embodiment of the invention having the appearance of a chili pepper.

[0031] The proper selection of proper materials and joining means to use carrying out the present invention is largely particular to the application and will be readily apparent to those skilled in the art based on the foregoing teachings. By way of example, and not limitation, in some embodiments for outdoor applications covering items such as barbeques, the 2D cover material and the materials forming the 3D structures according to the present invention would use commonly available, relatively flexible, weather resistant materials that configured to substantially protect the object being covered from environmental damage.

Having fully described at least one embodiment of the present invention, other equivalent or alternative methods of implementing 3D covers for objects according to the present invention will be apparent to those skilled in the art. The invention has been described above by way of illustration, and the specific embodiments disclosed are not intended to limit the invention to the particular forms disclosed. For example, those in the art will appreciate that although the embodiments of FIGS 1-3 were directed to a cow shaped 3D cover, the teaching attendant to the present invention are readily extendable to creating a wide range of covers having suitably shaped 3D structures, by way of example and not limitation, covers with relatively arbitrary appendages, heads, bodies, ornamental features, geometric shapes. An exemplary list of possible 3D covers configured according to the teachings of the present invention include, but is not limited to: a rocket, dog, cow, pig, ghost, hamburger, fish, ketchup bottle, mustard bottle, nose and glasses, car, bear, bush, chili pepper, car, chicken, house, man, woman, elephant, rhinoceros, alligator, and etc. In an aspect of the present invention, any conventional material, such as a fabric, used cover and/or protect an indoor or outdoor item may be shaped into a multiplicity of 3D structures and be configured to provide the esthetic value and/or environmental protection desired by the user. Moreover, the particular implementation of the described materials (e.g., the covering, interior, and backing materials) may vary depending upon the particular application. The described materials in the foregoing embodiments were directed to materials that are relatively lightweight and flexible yet stiff enough to hold their shape, while being readily capable of being packed relatively flat for optimal storage or shipping, and naturally restore its shape after being collapsed; however, certain applications in accordance with the foregoing teachings may select relatively rigid materials and not substantially lightweight, collapsible, or flexible, whereby these implementations of the present invention are contemplated as within the scope of the present invention. Furthermore, the 3D covers in the foregoing illustrated embodiments were directed to cover outdoor objects; however, similar techniques taught by the present invention are directly applicable to indoor objects as well, and are contemplated as within the scope of the present invention. Similarly, although 3D covers directed manmade outdoor objects were discussed in the foregoing embodiments, those in the art will readily now how to adapt the teachings of the present invention to cover

natural, non-manmade object such as, by way of example and not limitation, plants and shrubs. Those in the art will additionally readily recognize that although the substantially hollow 3D structures described in the foregoing embodiments were characterized as principally esthetic in nature, it is contemplated that other embodiments of the present

5 invention readily configure the substantially hollow 3D structures to properly receive protruding portions of the object they are covering; by way of example and not limitation, if covering a barbecue that has long horizontal handle extending from its lid, then an embodiment of the present invention properly covering this object may include an appropriately placed hole in the two-dimensional (2D) cover material such that the handle

10 may be received within the substantially hollow 3D structure when the present 3D cover is properly fitted in place covering the barbecue of the present example in accordance with the teachings of the present invention.. The invention is thus to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the following claims.

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